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THIRD QUARTER 2004 GROUNDWATER SAMPLING STUDY AREA 36 NW MAIN BASE NTC
ORLANDO FL
3/1/2005
TERRAINE ENVIRONMENTAL



Environmental Consulting

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Third Quarter 2004 **GROUNDWATER SAMPLING STUDY AREA 36 NW – MAIN BASE**

**Naval Training Center
Orlando, Florida**



**Southern Division
Naval Facilities Engineering Command**
Contract Number: N62467-02-G-0352
Contract Task Order: 0004

Prepared by:

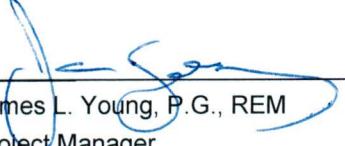
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March 2005

SIGNATURE PAGE

We, the undersigned, James L. Young and Karen L. Baer, do hereby affirm that the information contained in this report is accurate and correct to the best of our knowledge and belief.


James L. Young, P.G., REM
Project Manager

Terraine, Inc.

3/15/05

PG-FL2090, REM-6089

Registration Nos.



Karen L. Baer
Field Superintendent
Terraine, Inc.

Date

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ACRONYMS

AMSL	Above Mean Sea Level
BGS	Below Ground Surface
BTOC	Below Top of Casing
°C	Degrees Celsius
CTO	Contract Task Order
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Cleanup Target Levels
IDW	Investigation Derived Waste
µg/L	micrograms per liter
mg/L	milligrams per liter
MTBE	Methyl <i>tert</i> -butyl ether
mS/cm	millisiemens per centimeter
mV	millivolts
NM	Not Measured
nM	nanomoles
NA	Not Analyzed
NTC	Naval Training Center
NTU	Nephelometric Turbidity Units
OPT	Orlando Partnering Team
ORP	Oxidation-Reduction Potential
SA	Study Area
SA36NW	Study Area 36 NW
SU	Standard Unit
TERRAINE	Terraine, Inc.
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbon
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

SCOPE

The scope of work for the 2004 year of groundwater monitoring at Study Area 36 NW (SA36NW) consists of four rounds of quarterly groundwater monitoring, including groundwater-level measurements, purging, and low-flow sampling. This groundwater monitoring report summarizes the field activities and sampling results and provides an evaluation of concentration trends for the groundwater data from the third quarter of sampling in 2004.

NATURE AND EXTENT OF CONTAMINATION

The Groundwater Cleanup Target Levels (GCTL) for benzene was exceeded at two wells (MW-41CR, 29.4 µg/L; MW-43C, 273 µg/L), benzene was not detected in the other four wells. Methyl tert-butyl ether (MTBE) was above the GCTL at MW-43C (51.8 µg/L), and detected below GCTL at MW-41C and MW-42C. All other detections above GCTL were isolated to well MW-38C for ethylbenzene (83.9 µg/L), isopropylbenzene (8.83 µg/L), naphthalene (343 µg/L), 1,2,4-trimethylbenzene (816 µg/L), 1,3,5-trimethylbenzene (207 µg/L), and total xylenes (975 µg/L).

CONCLUSION & RECOMMENDATION

Based on the evaluation of the 3rd quarter analytical results, and analytical data to date, the following is recommended for this site:

- Continue sampling groundwater from monitoring wells on a quarterly basis.

**GROUNDWATER SAMPLING AT STUDY AREA 36 NW
NAVAL TRAINING CENTER, ORLANDO
September 2004**

<i>PREPARED FOR:</i>	Ms. Barbara Nwokike - SOUTHDIV
<i>PREPARED BY:</i>	TERRAINE, Inc.
<i>PERIOD OF PERFORMANCE:</i>	June 16, 2004 – September 11, 2004
<i>FIELD TEAM:</i>	Karen Baer and Larry Wolski
<i>CONTRACT NUMBER:</i>	N62467-02-G-0352
<i>TASK ORDER NUMBER:</i>	0004
<i>TASK ORDER MANAGER:</i>	James L. Young, P.G.; REM
<i>SUBMITTAL DATE:</i>	March 2005

1.0 INTRODUCTION

This report presents the results of the Third Quarter, 2004 groundwater sampling performed by TERRAINE, Inc. at Study Area 36 NW (SA36NW) at the Naval Training Center (NTC) Orlando in Orlando, Florida, completed in September 2004. This work was performed under **Contract No. N62467-02-G-0352, Contract Task Order (CTO) No. 0004**. Field activities were performed in accordance with the *Work Plan: Long Term Monitoring Services at Former Naval Training Center, Orlando, Florida* [Terraine, Inc., 2003].

1.1 Site Location and Description

Study Area 36 NW is located within the southwest corner of the Main Base at NTC, Orlando as shown on **Figure 1**. The Main Base has been modified by Orlando NTC Partners (OPT) to develop the land for residential use (**Figure 2**). SA36NW refers to the area where petroleum contamination in groundwater migrated from the former Main Base Auto Service Station (Building 109). SA36NW is immediately northwest of Study Area 36, which previously contained Buildings 2121, 2122 and the western half of the Public Works Yard.

2.0 INVESTIGATION & METHODOLOGY SUMMARY

2.1 Summary of Field Activities and Results

2.1.1 Water level measurements

Groundwater level measurements were collected from each of the monitoring wells on September 10, 2004 (**Table 1**).

2.1.2 Groundwater Sampling

2.1.2.1 Methodology

Groundwater sampling was conducted at SA36NW on September 12, 2004. Six (6) wells were purged and sampled using the low-flow method described in the work plan. Purging of wells consisted of removing groundwater with a peristaltic pump at a flow rate equal to or less than the groundwater recharge rate until field parameters (temperature, pH, conductivity, turbidity, Dissolved Oxygen (DO), and oxidation-reduction potential (ORP) had stabilized. Water levels in the wells were continuously monitored to maintain drawdown at less than 0.3 feet. The 3rd quarter 2004 groundwater sampling event was conducted in accordance with the *Work Plan: Long Term Monitoring Services at Former Naval Training Center, Orlando, Florida* [Terraine, Inc., 2003]. Field-testing equipment was calibrated according to the manufacturer instructions.

2.1.2.2 Chemical Analysis Suite

Groundwater samples from the monitoring wells were laboratory analyzed for the following analyte suite:

- VOCs by EPA Method 8260B
- TPH by FL-PRO
- Nitrate, nitrite, and sulfate by Environmental Protection Agency (EPA) Method 300.0
- Methane by RSK175M
- Hydrogen by Vaportech Method VA 3.01

In addition, the field team measured natural attenuation parameters dissolved oxygen, carbon dioxide, alkalinity, ferrous iron, hydrogen sulfide, and manganese from each well using field test kits. Temperature, ORP, DO, pH, specific conductivity, and turbidity were also recorded. This information is summarized in **Tables 2 and 3**.

2.1.3 Investigation Derived Waste

In accordance with the Work Plan, purge waters were collected and containerized. Groundwater analytical results were used to determine the disposal requirements of the purge waters. All investigation derived waste (IDW) was stored offsite in 55-gallon drums pending receipt and evaluation of analytical results. After obtaining results, the IDW

was properly disposed as non-hazardous waste in accordance with all pretreatment standards in the City of Orlando's sanitary sewer system in an existing manhole located at the area C site located off Warehouse Road on October 18, 2004.

2.1.4 Deviations From Work Plan

There were no deviations from the Work Plan for this sampling period.

2.2 Data Validation and Graphical Analysis

2.2.1 Data Validation

The data were validated using EarthSoft's Electronic Lab Data Checker, Version 1.01. The validation process results in qualifiers that are shown with the analyte concentrations in **Tables 2 through 5**.

2.2.2 Contour Maps - Techniques

Information gathered from point locations were converted to groundwater potentiometric and exceedance plume maps using a kriging interpolation method. Kriging uses a set of known vector point elements to predict a grid of values that are assigned to raster cells, with the output representing a geophysical surface. The potentiometric and exceedance plume maps were created using Surfer™ (Golden, Inc.) software and the linear-variogram model.

3.0 EVALUATION OF RESULTS

3.1 Water Level Measurements

Table 1 presents a summary of the groundwater elevations as noted on September 10, 2004. **Figure 3** illustrates the recent groundwater flow at SA36NW, which is to the east.

3.2 Analytical Results

Table 2 presents a summary of the validated analytical results from the 3rd Quarter 2004 sampling event. **Table 3** presents a summary of detected constituents from September 2003 through the current sampling event. For organic analytes, the screening criterion is the Florida Department of Environmental Protection (FDEP) GCTL. Shaded cells within the table indicate analyte concentrations above the FDEP GCTL or background screening values.

The Groundwater Cleanup Target Levels (GCTL) for benzene was exceeded at two wells (MW-41CR, 29.4 µg/L; MW-43C, 273 µg/L), benzene was not detected in the other four wells. Methyl tert-butyl ether (MTBE) was above the GCTL at MW-43C (51.8 µg/L), and detected below GCTL at MW-41C and MW-42C. All other detections above GCTL were isolated to well MW-38C for ethylbenzene (83.9 µg/L), isopropylbenzene (8.83 µg/L), naphthalene (343 µg/L), 1,2,4-trimethylbenzene (816 µg/L), 1,3,5-trimethylbenzene (207 µg/L), and total xylenes (975 µg/L).

3.3 Evaluation of Natural Attenuation

The September 2004 groundwater-sampling results for SA36NW indicate potential for biodegradation due to the following observations:

- The ORP of the aquifer was within the range favorable for anaerobic reactions (i.e., less than 100 mV) at each of the six locations where ORP was measured. Groundwater from five of the six wells sampled had negative ORP which is indicative of reducing conditions (**Table 2**).
- The nitrate concentrations were below 0.4 mg/L in the groundwater in all wells sampled (**Table 2**), therefore, nitrate reduction should not interfere with reductive dechlorination.
- Hydrogen levels were greater than 3.5 nM in groundwater sampled from all wells. Hydrogen levels greater than 1nm/L indicate that reductive dechlorination is possible.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the evaluation of the 3rd quarter analytical results, and analytical data to date, the following is recommended for this site:

- Continue sampling groundwater from monitoring wells on a quarterly basis.

5.0 REFERENCES

Florida Department of Environmental Protection. *Chapter 62-777 Contaminant Cleanup Target Levels*, 1999.

Terraine, Inc. *Work Plan: Long Term Monitoring Services At Former Naval Training Center, Orlando, Florida*, 2003.

TABLES

Table 1	<i>Water Level Elevations Summary</i>
Table 2	<i>Groundwater Analytical Results – September 2004</i>
Table 3	<i>Historical Detections in Groundwater</i>
Table 4	<i>Summary of Validated Analytical Results</i>

TABLE 1

**WATER LEVEL ELEVATIONS SUMMARY
STUDY AREA 36 NW**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

Well Number	Screen Interval (BGS)	Well Type	Date Installed	TOC Elevation ⁽¹⁾ (AMSL)	09/09/03		02/09/04		03/20/04		06/11/04		09/12/04	
					Depth to Water (BTOC)	Groundwater Elevation (AMSL)	Depth to Water (BTOC)	Groundwater Elevation (AMSL)	Depth to Water (BTOC)	Groundwater Elevation (AMSL)	Depth to Water (BTOC)	Groundwater Elevation (AMSL)	Depth to Water (BTOC)	Groundwater Elevation (AMSL)
MW-38C	30-35	2-inch	9/5/03	115.59	6.17	109.42	7.38	108.21	7.32	108.27	7.68	107.91	3.41	112.18
MW-39C	30-35	2-inch	9/8/03	114.77	6.55	108.22	Not Measured		8.63	106.14	7.98	106.79	3.61	111.16
MW-40D	49-54	2-inch	9/3/03	115.19	8.96	106.23	9.51	105.68	9.1	106.09	11.32	103.87	Not measured	
MW-41C	30-35	2-inch	9/3/03	114.62	7.9	106.72	9.13	105.49	9.01	105.61	9.3	105.32	4.93	109.69
MW-42C	30-35	2-inch	9/3/03	113.09	6.69	106.40	7.86	105.23	7.7	105.39	8.2	104.89	3.67	109.42
MW-43C	30-35	2-inch	9/4/03	113.35	7.1	106.25	8.3	105.05	8.24	105.11	8.45	104.90	4.11	109.24
MW-44C	30-35	2-inch	9/5/03	114.65	8.75	105.90	10.05	104.60	9.95	104.70	10.05	104.60	5.98	108.67
MW-45C	30-35	2-inch	8/24/04	112.28	Not Installed		Not Installed		Not Installed		Not Installed		Not Measured	
MW-46D	55-60	2-inch	8/24/04	114.62	Not Installed		Not Installed		Not Installed		Not Installed		Not Measured	

Notes:

All measurements are in units of feet.

AMSL - Above mean sea level.

BGS - Below ground surface.

BTOC - Below top of casing.

TOC - Top of casing.

⁽¹⁾ Top of casing elevations for wells MW-38C through MW-44C are from the survey performed on December 2, 2003. Top of casing elevations for wells MW-45C and MW-46D are from the November 1, 2004 survey. Vertical datum for both surveys is the National Geodetic Vertical Datum (NGVD) 1929.

TABLE 2
GROUNDWATER ANALYTICAL RESULTS - SEPTEMBER 2004
STUDY AREA 36NW
NAVAL TRAINING CENTER
ORLANDO, FLORIDA

WELL DESIGNATION	Screening Criteria	MW-38C	MW-39C	MW-41C	MW-42C	MW-43C	MW44C	MW45C	MW46D
SAMPLE ID	Florida	MW-38C	MW-39C	MW-41C	MW-42C	MW-43C	MW44C	MW44C	MW44C
SAMPLE DATE	GCTL ^(a)	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04
Volatile Organics (µg/L)									
Benzene	1			29.4		273		NS	NS
Ethylbenzene	30	83.9		1.42				NS	NS
Isopropylbenzene	0.8	8.83						NS	NS
4-Isopropyltoluene	*	15				2.51		NS	NS
Naphthalene	20	343				9.2		NS	NS
Toluene	40	3.1				6.88		NS	NS
Trichloroethene	3					1.9	1.68	NS	NS
1,2,4-Trimethylbenzene	10	816				2.09		NS	NS
1,3,5-Trimethylbenzene	10	207						NS	NS
Total Xylenes	20	975		1.31				NS	NS
Methyl <i>tert</i> -Butyl Ether	50			33.9	3.86	51.8		NS	NS
Petroleum Hydrocarbons (µg/L)									
Total Petroleum Hydrocarbons	5000	4000						NS	NS
Dissolved Gases (nM)									
Hydrogen	*	4.4	3.9	4.2	3.5	4	3.9	NS	NS
Miscellaneous Parameters (µg/L)									
Methane	*	2620		304	119	3100	487	NS	NS
Nitrate-N	10000		407			60		NS	NS
Nitrite-N	1000		18					NS	NS
Sulfate	250000	7420	48600	8730	14400	12700		NS	NS
Natural Attenuation Parameters (mg/L)									
Alkalinity	*	80	60	85	15	30	10	NS	NS
Carbon Dioxide	*	230	135	143	134	165	130	NS	NS
Dissolved Oxygen	*							NS	NS
Ferrous Iron	*	0.5		1.6	6.2	3	1.4	NS	NS
Hydrogen Sulfide	*	5		0.2	3	5	5	NS	NS
Manganese	*							NS	NS
Field Parameters									
Dissolved Oxygen (mg/L)	*	5.58	0.4	0.12	0.32	0.11	0.31	NS	NS
Temperature (°C)	*	26.57	26.99	26.44	26.37	26.36	26.59	NS	NS
SEC (µS/cm)	*	262	459	315	101	117	52	NS	NS
pH (SU)	*	5.58	5.47	7.07	5.12	6.07	4.8	NS	NS
ORP (mV)	*	-203.4	81	-199	-119.3	-147	-147.5	NS	NS
Turbidity (NTU)	*	53	4.37	6.43	65.9	584	68.3	NS	NS

Notes:

^(a) Groundwater Cleanup Target Level [Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., May 26, 1999].

* Indicates that the screening value is not available.

Empty cells indicate parameter not detected

"U" qualifier indicates a non-detect.

Values in shaded cells meet or exceed the screening criteria.

µg/L: milligrams per liter

µg/L: micrograms per liter

nM: nanomoles

µS/cm: microsiemens per centimeter

°C: degrees Celsius

mV: millivolts

SU: Standard Units

NTU: Nephelometric Turbidity Units

NS = Not Sampled

TABLE 3

**HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 36NW**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

WELL DESIGNATION	CAS NUMBER	Screening Criteria	MW-38C				MW-39C				
			Florida	GCTL^(a)	NTC36G38C01	OLD-36N-38C-032304	OLD-36N-38C-061404	MW-38C	NTC36G39C01	OLD-36N-39C-032304	OLD-36N-39C-061404
Volatile Organics (µg/L)											
1,2,4-Trimethylbenzene	95-63-6	10	NA		24.5		26.3	816	NA		
1,2-Dichloroethane	107-06-2	3									
1,3,5-Trimethylbenzene	108-67-8	10	NA		88.9		9.05	207	NA		
2-Butanone	78-93-3	4200			1.07						
4-Isopropyltoluene	99-87-6	*	NA		6.05		4.36	15	NA		
Acetone	67-64-1	700									
Benzene	71-43-2	1									
Bromodichloromethane	75-27-4	0.6									
Carbon Disulfide	75-15-0	700	4.1								
Chlorodibromomethane	124-48-1	0.4									
Chloroform	67-66-3	5.7	2.7						2.5		
cis-1,2-Dichloroethene	156-59-2	70									
Ethylbenzene	100-41-4	30	8.9		12.9		12.6	83.9			
Isopropylbenzene	98-82-8	0.8	NA		4.42		4.2	8.83	NA		
methyl <i>tert</i> -butyl Ether	1634-04-4	50									
Methylene Chloride	75-09-2	5									
n-Butylbenzene	104-51-8	*	NA			45.1			NA		
n-Propylbenzene	103-65-1	*	NA		10.9		10.6		NA		
Naphthalene	91-20-3	20	NA		176		222	343	NA		
Tetrachloroethene	127-18-4	3									
Toluene	108-88-3	40	0.67 J					3.1			
Total Xylenes	1330-20-7	20	78.4		1.07		10.6	975			
Trichloroethene	79-01-6	3									
Petroleum Hydrocarbons (µg/L)											
Total Petroleum Hydrocarbons	NO CAS#	5000	NA		1420		580	4000	NA		
Dissolved Gases (nM/L)											
Hydrogen	1333-74-0	*	NA		3.1		2.6	4.4	NA	2.2	2.6
Miscellaneous Parameters (µg/L)											
Methane	74-82-8	*	NA			138		2620	NA		
Nitrate-N	14797-55-8	10000	NA		11				NA	107	227
Nitrite-N	14797-65-0	1000	NA						NA		
Sulfate	14808-79-8	250000	NA			25100		7420	NA	48200	5920
Total Dissolved Solids	C-010	500000	NA		NA		NA	NA	NA	NA	NA
Natural Attenuation Parameters (mg/L)											
Alkalinity	NO CAS#	*	NA		NA		NA	80	NA	NA	NA
Carbon Dioxide	124-38-9	*	NA		NA		NA	230	NA	NA	NA
Dissolved Oxygen	NO CAS#	*									
Ferrous Iron	NO CAS#	*						0.5			
Hydrogen Sulfide	NO CAS#	*						5			
Manganese	NO CAS#	*									

TABLE 3

**HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 36NW**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

WELL DESIGNATION	CAS NUMBER	Screening Criteria	MW-39C	MW-40D				MW-41C	
		Florida	MW-39C	NTC36G40D01	NTC36G40D02	OLD-36N-40D-032304	OLD-36N-40D-061404	NTC36G41C01	NTC36G41C01-D
SAMPLE ID		GCTL ^(a)	09/12/04	09/10/03	02/09/04	03/23/04	06/14/04	09/09/03	09/09/03
Volatile Organics (µg/L)									
1,2,4-Trimethylbenzene	95-63-6	10		NA	NA	2.93		NA	NA
1,2-Dichloroethane	107-06-2	3							
1,3,5-Trimethylbenzene	108-67-8	10		NA	NA	1.3		NA	NA
2-Butanone	78-93-3	4200				14.4			
4-Isopropyltoluene	99-87-6	*		NA	NA			NA	NA
Acetone	67-64-1	700			108 J	188			
Benzene	71-43-2	1		5.4 J	42.4 J	12.2	5.59	541	678
Bromodichloromethane	75-27-4	0.6							
Carbon Disulfide	75-15-0	700			33.8 J	57.6	7.99	5.1 J	6.6 J
Chlorodibromomethane	124-48-1	0.4							
Chloroform	67-66-3	5.7		5.8 J	1.1 J			9.4 J	9.6 J
cis-1,2-Dichloroethene	156-59-2	70							
Ethylbenzene	100-41-4	30			43 J	7.89	4.08	91.1	96.7
Isopropylbenzene	98-82-8	0.8		NA	NA			NA	NA
methyl <i>tert</i> -butyl Ether	1634-04-4	50			0.51 J			105	114
Methylene Chloride	75-09-2	5							
n-Butylbenzene	104-51-8	*		NA	NA			NA	NA
n-Propylbenzene	103-65-1	*		NA	NA			NA	NA
Naphthalene	91-20-3	20		NA	NA			NA	NA
Tetrachloroethene	127-18-4	3							
Toluene	108-88-3	40			0.73 J			92.6	102
Total Xylenes	1330-20-7	20			19.5 J	4.93	1.28	187	201
Trichloroethene	79-01-6	3							
Petroleum Hydrocarbons (µg/L)									
Total Petroleum Hydrocarbons	NO CAS#	5000		NA	NA	11600		NA	NA
Dissolved Gases (nM/L)									
Hydrogen	1333-74-0	*	3.9	NA	NA	2.4	2.5	NA	NA
Miscellaneous Parameters (µg/L)									
Methane	74-82-8	*		NA	NA			NA	NA
Nitrate-N	14797-55-8	10000	407	NA	NA	953	37	NA	NA
Nitrite-N	14797-65-0	1000	18	NA	NA		64	NA	NA
Sulfate	14808-79-8	250000	48600	NA	NA	250000	96800	NA	NA
Total Dissolved Solids	C-010	500000	NA	NA	NA	1630000	NA	NA	NA
Natural Attenuation Parameters (mg/L)									
Alkalinity	NO CAS#	*	60	NA	NA	1360	NA	NA	NA
Carbon Dioxide	124-38-9	*	135	NA	NA		NA	NA	NA
Dissolved Oxygen	NO CAS#	*							
Ferrous Iron	NO CAS#	*							
Hydrogen Sulfide	NO CAS#	*							
Manganese	NO CAS#	*							

TABLE 3

**HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 36NW**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

WELL DESIGNATION	CAS NUMBER	Screening Criteria	MW-41C				MW-42C				
			Florida	GCTL^(a)	OLD-36N-41C-032304	OLD-36N-41C-061404	NTC36G41C05	MW-41C	NTC36G42C01	OLD-36N-42C-032304	OLD-36N-42C-061404
SAMPLE ID											
SAMPLE DATE											
Volatile Organics (µg/L)											
1,2,4-Trimethylbenzene	95-63-6	10				NA		NA			
1,2-Dichloroethane	107-06-2	3				5.1	29.4				
1,3,5-Trimethylbenzene	108-67-8	10				NA		NA			
2-Butanone	78-93-3	4200									
4-Isopropyltoluene	99-87-6	*				NA		NA			
Acetone	67-64-1	700									
Benzene	71-43-2	1	3.26		5.8	207	29.4	2.6			
Bromodichloromethane	75-27-4	0.6						0.72 J			
Carbon Disulfide	75-15-0	700						5.5			
Chlorodibromomethane	124-48-1	0.4									
Chloroform	67-66-3	5.7						10			
cis-1,2-Dichloroethene	156-59-2	70									
Ethylbenzene	100-41-4	30				20.6	1.42				
Isopropylbenzene	98-82-8	0.8				NA		NA			
methyl <i>tert</i> -butyl Ether	1634-04-4	50	24.6		25.3	84.6	33.9	1.7 J	1.95		
Methylene Chloride	75-09-2	5						1.1 J			
n-Butylbenzene	104-51-8	*				NA		NA			
n-Propylbenzene	103-65-1	*				NA		NA			
Naphthalene	91-20-3	20				NA		NA			
Tetrachloroethene	127-18-4	3									
Toluene	108-88-3	40									
Total Xylenes	1330-20-7	20				28.6	1.31				
Trichloroethene	79-01-6	3									
Petroleum Hydrocarbons (µg/L)											
Total Petroleum Hydrocarbons	NO CAS#	5000				NA		NA			
Dissolved Gases (nM/L)											
Hydrogen	1333-74-0	*	2.5		2.7	NA	4.2	NA	2.9		
Miscellaneous Parameters (µg/L)											
Methane	74-82-8	*			264	NA	304	NA			
Nitrate-N	14797-55-8	10000	76			NA		NA	13		
Nitrite-N	14797-65-0	1000				NA		NA			
Sulfate	14808-79-8	250000	15800		7980	NA	8730	NA	10100		
Total Dissolved Solids	C-010	500000	NA		NA	NA	NA	NA	NA		
Natural Attenuation Parameters (mg/L)											
Alkalinity	NO CAS#	*	NA		NA	NA	85	NA	NA		
Carbon Dioxide	124-38-9	*	NA		NA	NA	143	NA	NA		
Dissolved Oxygen	NO CAS#	*									
Ferrous Iron	NO CAS#	*					1.6				
Hydrogen Sulfide	NO CAS#	*					0.2				
Manganese	NO CAS#	*									

TABLE 3

**HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 36NW**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

WELL DESIGNATION	CAS NUMBER	Screening Criteria	MW-42C		MW-43C			
		Florida	NTC36G42C05	MW-42C	NTC36G43C01	OLD-36N-43C-032304	OLD-36N-43C-061404	NTC36G43C05
SAMPLE ID								
SAMPLE DATE	GCTL ^(a)	08/31/04	09/12/04	09/09/03	03/23/04	06/14/04	08/31/04	
Volatile Organics (µg/L)								
1,2,4-Trimethylbenzene	95-63-6	10	NA		NA			NA
1,2-Dichloroethane	107-06-2	3						
1,3,5-Trimethylbenzene	108-67-8	10	NA		NA			NA
2-Butanone	78-93-3	4200						
4-Isopropyltoluene	99-87-6	*	NA		NA		1.35	NA
Acetone	67-64-1	700						
Benzene	71-43-2	1			0.83 J	24.8	15.8	342
Bromodichloromethane	75-27-4	0.6			0.54 J			
Carbon Disulfide	75-15-0	700			2.5			
Chlorodibromomethane	124-48-1	0.4						
Chloroform	67-66-3	5.7			4.6			
cis-1,2-Dichloroethylene	156-59-2	70						
Ethylbenzene	100-41-4	30						
Isopropylbenzene	98-82-8	0.8	NA		NA			NA
methyl <i>tert</i> -butyl Ether	1634-04-4	50	4.1	3.86	21.8	19.3	12.8	98.1
Methylene Chloride	75-09-2	5						
n-Butylbenzene	104-51-8	*	NA		NA			NA
n-Propylbenzene	103-65-1	*	NA		NA			NA
Naphthalene	91-20-3	20	NA		NA			NA
Tetrachloroethene	127-18-4	3						
Toluene	108-88-3	40				2.92	2.36	6
Total Xylenes	1330-20-7	20						
Trichloroethene	79-01-6	3						
Petroleum Hydrocarbons (µg/L)								
Total Petroleum Hydrocarbons	NO CAS#	5000	NA		NA			NA
Dissolved Gases (nM/L)								
Hydrogen	1333-74-0	*	NA	3.5	NA	2.2	2.9	NA
Miscellaneous Parameters (µg/L)								
Methane	74-82-8	*	NA	119	NA	1040	3580	NA
Nitrate-N	14797-55-8	10000	NA		NA	5		NA
Nitrite-N	14797-65-0	1000	NA		NA			NA
Sulfate	14808-79-8	250000	NA	14400	NA	15800	10200	NA
Total Dissolved Solids	C-010	500000	NA	NA	NA	593000	564000	NA
Natural Attenuation Parameters (mg/L)								
Alkalinity	NO CAS#	*	NA	15	NA		NA	NA
Carbon Dioxide	124-38-9	*	NA	134	NA	1	300	NA
Dissolved Oxygen	NO CAS#	*						
Ferrous Iron	NO CAS#	*		6.2				
Hydrogen Sulfide	NO CAS#	*		3				
Manganese	NO CAS#	*						

TABLE 3

HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 36NW

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

WELL DESIGNATION	CAS NUMBER	Screening Criteria	MW-43C		MW-44C						
			Florida	GCTL ^(a)	NTC36G43C05-D	MW-43C	NTC36G44C01	OLD-36N-44C-032304	OLD-36N-44C-061404	MW-44C	
SAMPLE ID					08/31/04	09/12/04	09/09/03	03/23/04	06/14/04	09/12/04	
Volatile Organics (µg/L)											
1,2,4-Trimethylbenzene	95-63-6	10	NA		2.09	NA					
1,2-Dichloroethane	107-06-2	3									
1,3,5-Trimethylbenzene	108-67-8	10	NA			NA					
2-Butanone	78-93-3	4200									
4-Isopropyltoluene	99-87-6	*	NA		2.51	NA					
Acetone	67-64-1	700									
Benzene	71-43-2	1	351		273						
Bromodichloromethane	75-27-4	0.6									
Carbon Disulfide	75-15-0	700									
Chlorodibromomethane	124-48-1	0.4									
Chloroform	67-66-3	5.7				2.3					
cis-1,2-Dichloroethene	156-59-2	70				0.6 J					
Ethylbenzene	100-41-4	30									
Isopropylbenzene	98-82-8	0.8	NA			NA					
methyl <i>tert</i> -butyl Ether	1634-04-4	50	113		51.8						
Methylene Chloride	75-09-2	5									
n-Butylbenzene	104-51-8	*	NA			NA					
n-Propylbenzene	103-65-1	*	NA			NA					
Naphthalene	91-20-3	20	NA		9.2	NA					
Tetrachloroethene	127-18-4	3				4.8	1.1				
Toluene	108-88-3	40	5.1		6.88						
Total Xylenes	1330-20-7	20									
Trichloroethene	79-01-6	3			1.9	4.8	1.9	1.54	1.68		
Petroleum Hydrocarbons (µg/L)											
Total Petroleum Hydrocarbons	NO CAS#	5000	NA			NA					
Dissolved Gases (nM/L)											
Hydrogen	1333-74-0	*	NA		4	NA	4.1	2.8	3.9		
Miscellaneous Parameters (µg/L)											
Methane	74-82-8	*	NA		3100	NA	77	411	487		
Nitrate-N	14797-55-8	10000	NA		60	NA	9				
Nitrite-N	14797-65-0	1000	NA			NA					
Sulfate	14808-79-8	250000	NA		12700	NA	2560	2670			
Total Dissolved Solids	C-010	500000	NA			NA	NA				
Natural Attenuation Parameters (mg/L)											
Alkalinity	NO CAS#	*	NA		30	NA	NA	NA	10		
Carbon Dioxide	124-38-9	*	NA		165	NA	NA	NA	130		
Dissolved Oxygen	NO CAS#	*									
Ferrous Iron	NO CAS#	*			3				1.4		
Hydrogen Sulfide	NO CAS#	*			5				5		
Manganese	NO CAS#	*									

TABLE 3
HISTORICAL DETECTIONS IN GROUNDWATER
STUDY AREA 36NW
NAVAL TRAINING CENTER
ORLANDO, FLORIDA

WELL DESIGNATION	CAS NUMBER	Screening Criteria	MW-45C	MW-46D
		Florida GCTL ^(a)	NTC36G45C05 09/01/04	NTC36G46D05 09/01/04
Volatile Organics (µg/L)				
1,2,4-Trimethylbenzene	95-63-6	10	NA	NA
1,2-Dichloroethane	107-06-2	3		
1,3,5-Trimethylbenzene	108-67-8	10	NA	NA
2-Butanone	78-93-3	4200		
4-Isopropyltoluene	99-87-6	*	NA	NA
Acetone	67-64-1	700		
Benzene	71-43-2	1		
Bromodichloromethane	75-27-4	0.6		0.58 J
Carbon Disulfide	75-15-0	700		
Chlorodibromomethane	124-48-1	0.4	2	
Chloroform	67-66-3	5.7		1.4
cis-1,2-Dichloroethene	156-59-2	70		
Ethylbenzene	100-41-4	30		
Isopropylbenzene	98-82-8	0.8	NA	NA
methyl <i>tert</i> -butyl Ether	1634-04-4	50		
Methylene Chloride	75-09-2	5		
n-Butylbenzene	104-51-8	*	NA	NA
n-Propylbenzene	103-65-1	*	NA	NA
Naphthalene	91-20-3	20	NA	NA
Tetrachloroethene	127-18-4	3		
Toluene	108-88-3	40		
Total Xylenes	1330-20-7	20		
Trichloroethene	79-01-6	3		
Petroleum Hydrocarbons (µg/L)				
Total Petroleum Hydrocarbons	NO CAS#	5000	NA	NA
Dissolved Gases (nM/L)				
Hydrogen	1333-74-0	*	NA	NA
Miscellaneous Parameters (µg/L)				
Methane	74-82-8	*	NA	NA
Nitrate-N	14797-55-8	10000	NA	NA
Nitrite-N	14797-65-0	1000	NA	NA
Sulfate	14808-79-8	250000	NA	NA
Total Dissolved Solids	C-010	500000	NA	NA
Natural Attenuation Parameters (mg/L)				
Alkalinity	NO CAS#	*	NA	NA
Carbon Dioxide	124-38-9	*	NA	NA
Dissolved Oxygen	NO CAS#	*		
Ferrous Iron	NO CAS#	*		
Hydrogen Sulfide	NO CAS#	*		
Manganese	NO CAS#	*		

Notes:

^(a) Groundwater Cleanup Target Level [Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., May 26, 1999].

* Indicates that the screening value is not available.

Empty cells indicate non-detects.

"J" qualifier indicates an estimated value.

NA - No analysis performed.

Only chemicals detected in at least one sample are shown.

Values in shaded cells are equal to or exceed the screening criteria.

TABLE 4

VALIDATED GROUNDWATER ANALYTICAL RESULTS

SEPTEMBER 2004

STUDY AREA 36NW

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

WELL DESIGNATION	Screening Criteria	OLD-SA36NW-38C	OLD-SA36NW-39C	OLD-SA36NW-41C	OLD-SA36NW-42C	OLD-SA36NW-43C	OLD-SA36NW-44C	OLD-SA36NW-45C	OLD-SA36NW-46D
SAMPLE ID	Florida	MW-38C	MW-39C	MW-41C	MW-42C	MW-43C	MW44C	MW45C	MW46D
SAMPLE DATE	GCTL ^(a)	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04
Volatile Organics (µg/L)									
1,1-Dichloropropene	*	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Acetone	700	10 U	NS	NS					
Benzene	1	1 U	1 U	29.4	1 U	273	1 U	NS	NS
Bromobenzene	*	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Bromochloromethane	91	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Bromoform	4.4	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Bromomethane	9.8	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
2-Butanone	4200	1 U, J3	1 U, J3	1 U	1 U	1 U, J3	1 U	NS	NS
N-Butylbenzene	*	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Sec-Butylbenzene	*	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Tert-Butylbenzene	*	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Carbon Disulfide	700	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Carbon Tetrachloride	3	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Chlorobenzene	100	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Chloroethane	12	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
2-Chloroethyl Vinyl Ether	175	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Chloroform	5.7	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Chloromethane	2.7	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
2-Chlorotoluene	140	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
4-Chlorotoluene	140	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,2-Dibromo-3-Chloropropane	0.2	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Dibromochloromethane	0.4	0.4 U	NS	NS					
1,2-Dibromoethane	0.02	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Dibromomethane	*	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,2-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,3-Dichlorobenzene	10	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,4-Dichlorobenzene	75	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Dichlorodifluoromethane	1400	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,1-Dichloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,2-Dichloroethane	3	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,1-Dichloroethene	7	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
cis-1,2-Dichloroethene	70	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Trans-1,2-Dichloroethene	100	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,2-Dichloropropane	5	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,3-Dichloropropane	*	0.22 U	NS	NS					
2,2-Dichloropropane	*	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
cis-1,3-Dichloropropene	*	0.23 U	NS	NS					
Trans-1,3-Dichloropropene	*	0.2 U	NS	NS					
Ethylbenzene	30	83.9	1 U	1.42	1 U	1 U	1 U	NS	NS

TABLE 4

VALIDATED GROUNDWATER ANALYTICAL RESULTS

SEPTEMBER 2004

STUDY AREA 36NW

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

WELL DESIGNATION	Screening Criteria	OLD-SA36NW-38C	OLD-SA36NW-39C	OLD-SA36NW-41C	OLD-SA36NW-42C	OLD-SA36NW-43C	OLD-SA36NW-44C	OLD-SA36NW-45C	OLD-SA36NW-46D
SAMPLE ID	Florida	MW-38C	MW-39C	MW-41C	MW-42C	MW-43C	MW44C	MW45C	MW46D
SAMPLE DATE	GCTL ^(a)	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04	09/12/04
Volatile Organics (µg/L) (Continued)									
Hexachlorobutadiene	0.5	0.55 U	NS	NS					
2-Hexanone	280	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Isopropylbenzene	0.8	8.83	1 U	1 U	1 U	1 U	1 U	NS	NS
4-Isopropyltoluene	*	15	1 U	1 U	1 U	2.51	1 U	NS	NS
4-methyl-2-pentanone	560	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Methylene Chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	NS	NS
Naphthalene	20	343	5 U	5 U	5 U	9.2	5 U	NS	NS
N-Propylbenzene	*	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Styrene	100	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,1,1,2-Tetrachloroethane	1.3	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,1,2,2-Tetrachloroethane	0.2	0.2 U	NS	NS					
Tetrachloroethene	3	1 U	1 U, J3	1 U, J3	1 U, J3	1 U, J3	1 U	NS	NS
Toluene	40	3.1	1 U	1 U	1 U	6.88	1 U	NS	NS
1,2,3-Trichlorobenzene	70	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,2,4-Trichlorobenzene	70	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,1,2-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Trichloroethene	3	1 U	1 U	1 U	1 U	1 U	1.9	1.68	NS
1,2,3-Trichloropropane	0.2	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
1,2,4-Trimethylbenzene	10	816	1 U	1 U	1 U	2.09	1 U	NS	NS
1,3,5-Trimethylbenzene	10	207	1 U	1 U	1 U	1 U	1 U	NS	NS
Vinyl Chloride	1	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Total Xylenes	20	975	1 U	1.31	1 U	1 U	1 U	NS	NS
Bromodichloromethane	0.6	0.6 U	NS	NS					
Trichlorofluoromethane	2100	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS
Methyl <i>tert</i> -Butyl Ether	50	1 U	1 U	33.9	3.86	51.8	1 U	NS	NS
Petroleum Hydrocarbons (µg/L)									
Total Petroleum Hydrocarbons	5000	4000	210 U	210 U	200 U	210 U	200 U	NS	NS
Dissolved Gases (nM/L)									
Hydrogen	*	4.4	3.9	4.2	3.5	4	3.9	NS	NS
Miscellaneous Parameters (µg/L)									
Methane	*	2620	26 U	304	119	3100	487	NS	NS
Nitrate-N	10000	3.1 U	407	3.1 U	3.1 U	60	3.1 U	NS	NS
Nitrite-N	1000	3.5 U, J4	18	3.5 U	3.5 U	3.5 U	3.5 U	NS	NS
Sulfate	250000	7420	48600	8730	14400	12700	2000 U	NS	NS
Natural Attenuation Parameters (mg/L)									
Alkalinity	*	80	60	85	15	30	10	NS	NS
Carbon Dioxide	*	230	135	143	134	165	130	NS	NS
Dissolved Oxygen	*	0	0	0	0	0	0	NS	NS
Ferrous Iron	*	0.5	0	1.6	6.2	3	1.4	NS	NS
Hydrogen Sulfide	*	5	0	0.2	3	5	5	NS	NS
Manganese	*	0	0	0	0	0	0	NS	NS

TABLE 4

VALIDATED GROUNDWATER ANALYTICAL RESULTS
SEPTEMBER 2004
STUDY AREA 36NW

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

Notes:

(a) Groundwater Cleanup Target Level [Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., May 26, 1999].

* Indicates that the screening value is not available.

Empty cells indicate parameter not analyzed.

"U" qualifier indicates a non-detect.

"J3" qualifier indicates the reported value failed to meet the established quality control criteria for either precision and/or accuracy

"J4" qualifier indicates the sample matrix interfered with the ability to make an accurate determination

Values in shaded cells meet or exceed the screening criteria.

NS = Well not sampled

FIGURES

Figure 1 *Site Location Map, Study Area 36 NW*

Figure 2 *Site Map, Study Area 36 NW*

Figure 3 *Groundwater Potentiometric Surface Map*

Figure 4 *Groundwater Exceedances Map*

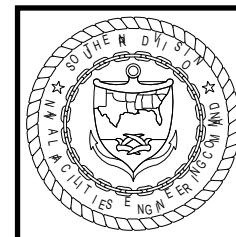
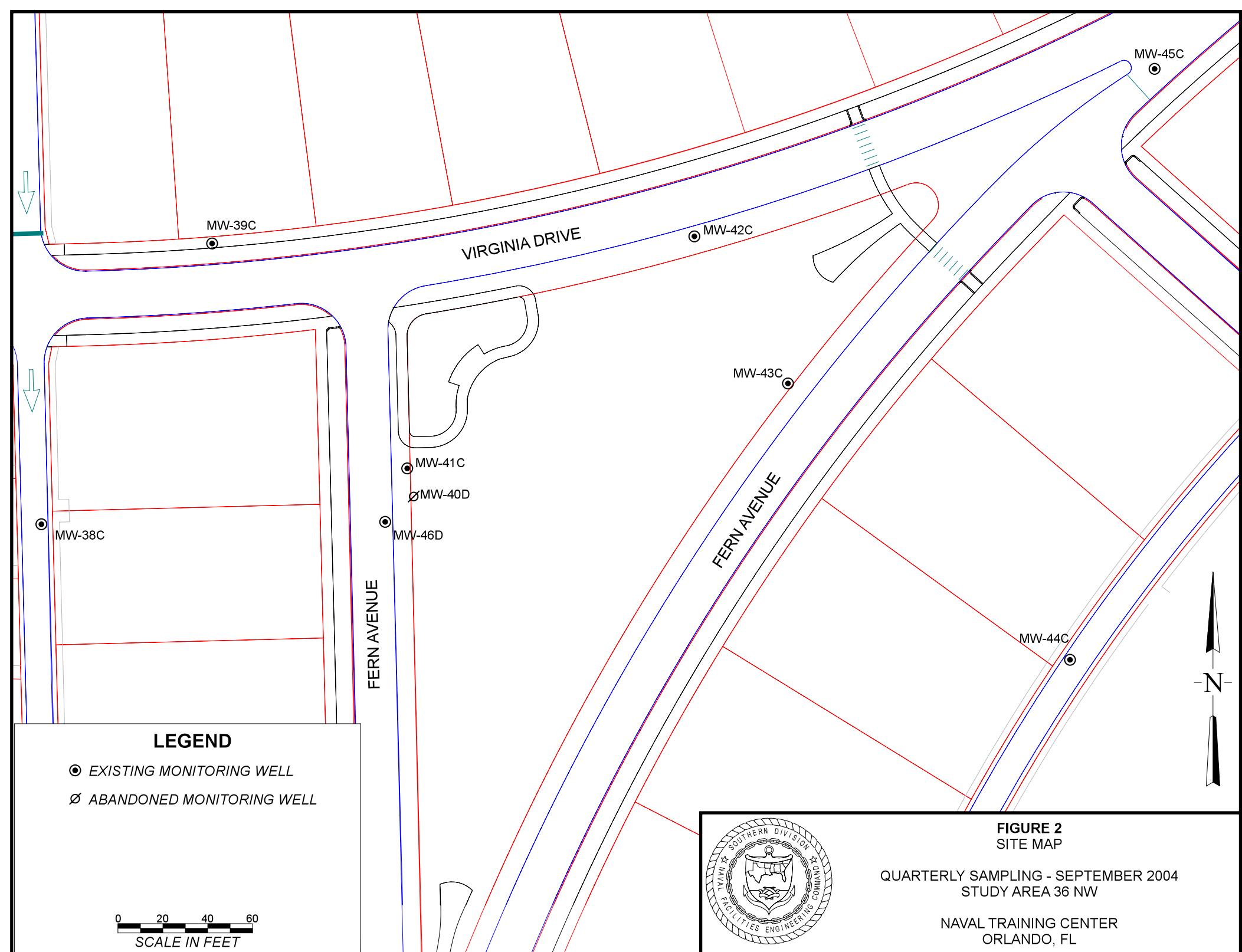
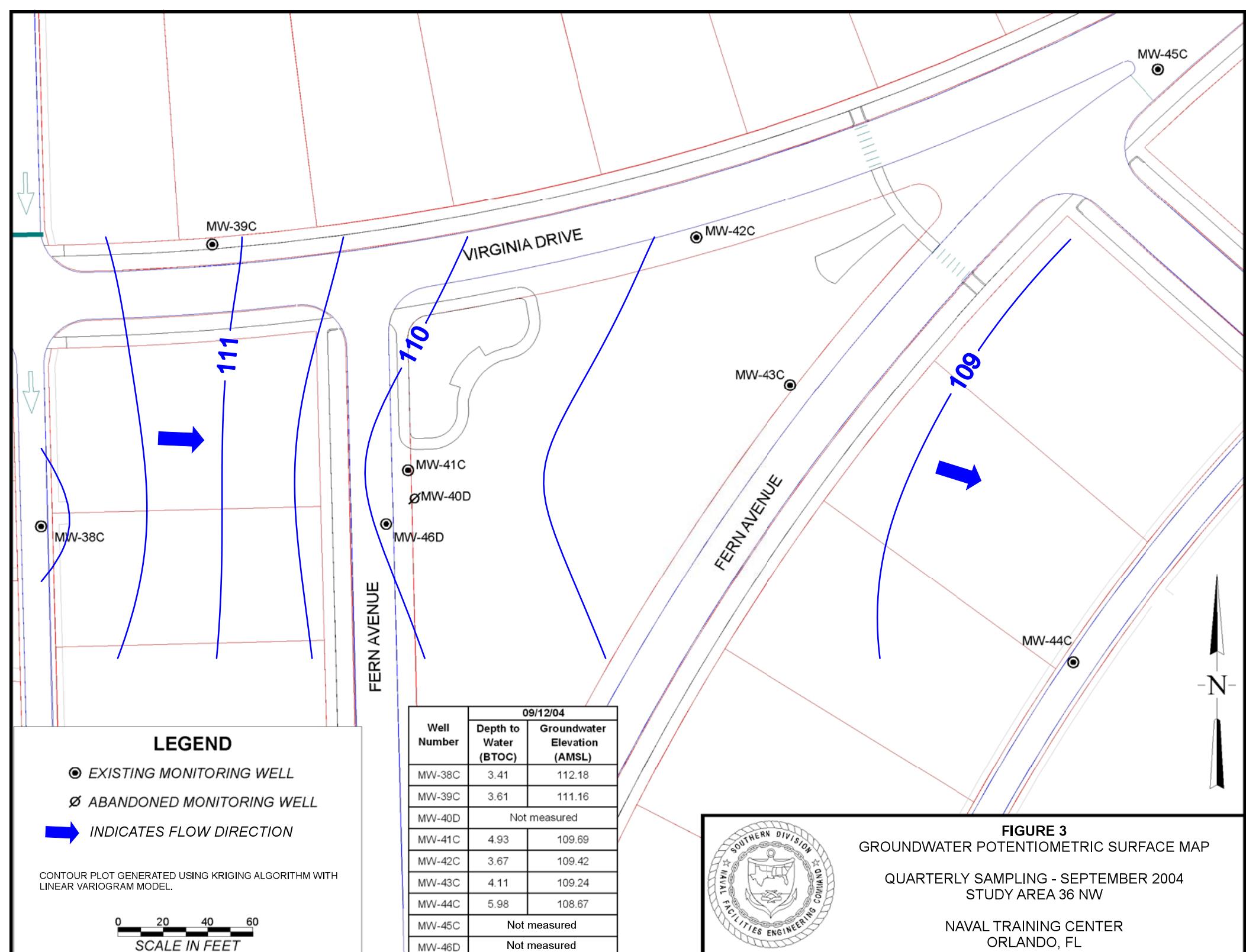


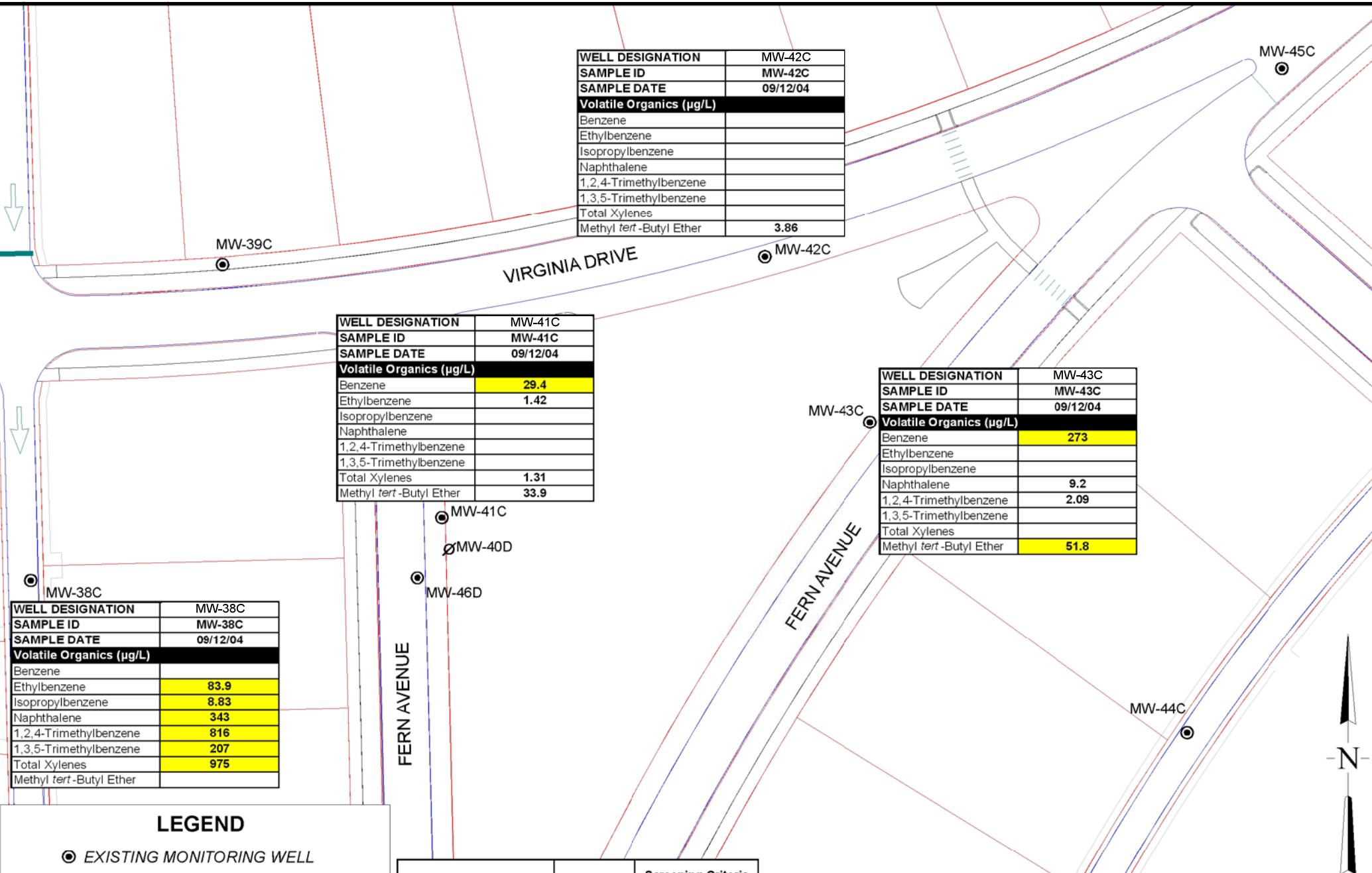
FIGURE 1
SITE LOCATION MAP
STUDY AREA 36 NW

QUARTERLY SAMPLING - SEPTEMBER 2004

NAVAL TRAINING CENTER
ORLANDO, FL







WELL DESIGNATION	CAS NUMBER	Screening Criteria
SAMPLE ID	Florida GCTL	SAMPLE DATE
SAMPLE DATE		
Volatile Organics (µg/L)		
Benzene	71-43-2	1
Ethylbenzene	100-41-4	30
Isopropylbenzene	98-82-8	0.8
Naphthalene	91-20-3	20
1,2,4-Trimethylbenzene	95-63-6	10
1,3,5-Trimethylbenzene	108-67-8	10
Total Xylenes	1330-20-7	20
Methyl <i>tert</i> -Butyl Ether	1634-04-4	50



FIGURE 4
GROUNDWATER EXCEEDANCES MAP
QUARTERLY SAMPLING - SEPTEMBER 2004
STUDY AREA 36 NW

NAVAL TRAINING CENTER
ORLANDO, FL

APPENDICES

A September 2004 Groundwater Sampling Logs

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 07-71009/7	Project Name: Groundwater Sampling at Study Area 36NW	
Technician 1:	Technician 2: Larry Wolski	Weather: "Cloudy, Muggy, Sunny"
Sampling ID: 07-71009/7:MW-38C:9/12/04		
Notes:		

Well Information

Well ID: MW-38C	Sampling Date: 9/12/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 35.50	Well Screen Interval (ft): 30-35
TOC Elevation (ft msl): 115.59	Northing: 1538002.58	Easting: 549256.67
Static Depth to Water (ft): 3.84	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 33.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Purge Start: 10:02	Purge End: 10:13	Total Volume Purged (gal): 0.60

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (μS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
10:07	4.63	0.30	0.06	0.72	26.84	280.0	5.66	-165.6	70.30	brown	slight HC
10:10	4.62	0.50	0.06	0.58	26.65	269.0	5.61	-184.8	60.00		
10:13	4.62	0.60	0.03	0.52	26.58	263.0	5.59	-169.9	55.00		

Sampling Data

Sample Information	Final Purge Readings	Hach Field Data (mg/L)	CHEMetrics Field Data (mg/L)
Sample Date: 9/12/2004	DO (mg/L): 5.58	DO: 0	DO High Range:
Sample Start Time: 10:15	Temp (°C): 26.57	CO2: 230	DO High Range:
Sample End Time: 10:30	SEC (μS/cm): 262	Alkalinity: 80	
Field Filtered: <input checked="" type="checkbox"/>	pH: 5.58	Ferrous Iron: 0.5	CO2 High Range:
Duplicate: <input checked="" type="checkbox"/>	ORP (mV): -203.4	H2S: 5	CO2 Low Range:
	Turb (NTU): 53	Manganese: 0	
<u>Lab Analyses/Methods:</u> "Methane, Nitrate/Nitrite, Sulfate, TRPH, VOCs, Hydrogen"	<u>Technician Initials</u>	Sulfate: Sulfide: Nitrate:	Alkalinity High Range: Alkalinity Low Range:

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 07-71009/7	Project Name: Groundwater Sampling at Study Area 36NW	
Technician 1: Karen Baer	Technician 2:	Weather: Sunny
Sampling ID: 07-71009/7:MW-39C:9/12/04		
Notes:		

Well Information

Well ID: MW-39C	Sampling Date: 9/12/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 35.50	Well Screen Interval (ft): 30-35
TOC Elevation (ft msl): 114.76	Northing: 1538128.53	Easting: 549333.25
Static Depth to Water (ft): 4.13	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 32.00
pH Meter: Horiba U-22	Cond. Meter: Horiba U-22	DO Meter: Horiba U-22
Purge Start: 10:21	Purge End: 10:31	Total Volume Purged (gal): 0.50

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (μS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
10:25	5.82	0.30	0.07	0.85	27.01	453.0	5.49	81.0	5.47	clear	none
10:28	5.86	0.40	0.03	0.76	27.06	455.0	5.48	80.0	3.88		
10:31	5.87	0.50	0.03	0.44	27.02	458.0	5.48	81.0	4.69		

Sampling Data

Sample Information	Final Purge Readings	Hach Field Data (mg/L)	CHEMetrics Field Data (mg/L)
Sample Date: 9/12/2004	DO (mg/L): 0.4	DO: 0	DO High Range:
Sample Start Time: 10:31	Temp (°C): 26.99	CO2: 135	DO High Range:
Sample End Time: 11:12	SEC (μS/cm): 459	Alkalinity: 60	
Field Filtered: <input type="checkbox"/>	pH: 5.47	Ferrous Iron: 0	CO2 High Range:
Duplicate: <input type="checkbox"/>	ORP (mV): 81	H2S: 0	CO2 Low Range:
	Turb (NTU): 4.37	Manganese: 0	
		Sulfate: 0	Alkalinity High Range:
		Sulfide: 0	Alkalinity Low Range:
<u>Lab Analyses/Methods:</u> "Methane, Nitrate/Nitrite, Sulfate, TRPH, VOCs, Hydrogen"	<u>Technician Initials</u>		

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 07-71009/7	Project Name: Groundwater Sampling at Study Area 36NW	
Technician 1: Karen Baer	Technician 2:	Weather: Sunny
Sampling ID: 07-71009/7:MW-41C:9/12/04		
Notes:		

Well Information

Well ID: MW-41C	Sampling Date: 9/12/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 35.50	Well Screen Interval (ft): 30-35
TOC Elevation (ft msl): 114.62	Northing: 1538027.58	Easting: 549420.83
Static Depth to Water (ft): 5.32	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 32.00
pH Meter: Horiba U-22	Cond. Meter: Horiba U-22	DO Meter: Horiba U-22
Purge Start: 09:12	Purge End: 09:28	Total Volume Purged (gal): 1.30

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (μS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
09:22	5.90	1.00	0.10	0.43	26.45	318.0	7.14	-199.0	7.30	clear	sulfuric
09:25	5.90	1.20	0.06	0.26	26.45	324.0	7.10	-199.0	6.91		
09:28	5.90	1.30	0.06	0.16	26.43	316.0	7.07	-198.0	6.28		

Sampling Data

Sample Information	Final Purge Readings	Hach Field Data (mg/L)	CHEMetrics Field Data (mg/L)
Sample Date: 9/12/2004	DO (mg/L): 0.12	DO: 0	DO High Range:
Sample Start Time: 09:28	Temp (°C): 26.44	CO2: 143	DO High Range:
Sample End Time: 10:06	SEC (μS/cm): 315	Alkalinity: 85	
Field Filtered: <input type="checkbox"/>	pH: 7.07	Ferrous Iron: 1.6	CO2 High Range:
Duplicate: <input type="checkbox"/>	ORP (mV): -199	H2S: 0.2	CO2 Low Range:
	Turb (NTU): 6.43	Manganese: 0	
		Sulfate: Alkalinity High Range:	
<u>Lab Analyses/Methods:</u> "Methane, Nitrate/Nitrite, Sulfate, TRPH, VOCs, Hydrogen"	Technician Initials	Sulfide: Alkalinity Low Range:	

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 07-71009/7	Project Name: Groundwater Sampling at Study Area 36NW	
Technician 1:	Technician 2: Larry Wolski	Weather: "Muggy, Sunny"
Sampling ID: 07-71009/7:MW-42C:9/12/04		
Notes:		

Well Information

Well ID: MW-42C	Sampling Date: 9/12/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 35.50	Well Screen Interval (ft): 30-35
TOC Elevation (ft msl): 113.08	Northing: 1538131.51	Easting: 549549.84
Static Depth to Water (ft): 4.01	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 33.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Purge Start: 08:56	Purge End: 09:12	Total Volume Purged (gal): 0.70

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (μS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
09:05	5.94	0.30	0.03	0.78	26.46	102.0	5.13	-84.5	64.80	turbid	sulfuric
09:08	6.23	0.50	0.06	0.46	26.41	102.0	5.14	-103.6	64.50		
09:11	6.49	0.70	0.06	0.36	26.37	101.0	5.13	-115.5	66.10		

Sampling Data

Sample Information	Final Purge Readings	Hach Field Data (mg/L)	CHEMetrics Field Data (mg/L)
Sample Date: 9/12/2004	DO (mg/L): 0.32	DO: 0	DO High Range:
Sample Start Time: 09:15	Temp (°C): 26.37	CO2: 134	DO High Range:
Sample End Time: 09:25	SEC (μS/cm): 101	Alkalinity: 15	
Field Filtered: <input checked="" type="checkbox"/>	pH: 5.12	Ferrous Iron: 6.2	CO2 High Range:
Duplicate: <input checked="" type="checkbox"/>	ORP (mV): -119.3	H2S: 3	CO2 Low Range:
	Turb (NTU): 65.9	Manganese: 0	
		Sulfate: Alkalinity High Range:	
<u>Lab Analyses/Methods:</u> "Methane, Nitrate/Nitrite, Sulfate, TRPH, VOCs, Hydrogen"	<u>Technician Initials</u>	Sulfide: Alkalinity Low Range:	

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 07-71009/7	Project Name: Groundwater Sampling at Study Area 36NW	
Technician 1: Karen Baer	Technician 2:	Weather: Sunny
Sampling ID: 07-71009/7:MW-43C:9/12/04		
Notes: Purge records lost during data transmission.		

Well Information

Well ID: MW-43C	Sampling Date: 9/12/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 35.50	Well Screen Interval (ft): 30-35
TOC Elevation (ft msl): 113.35	Northing: 1538065.7	Easting: 549591.51
Static Depth to Water (ft): 4.45	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 32.00
pH Meter: Horiba U-22	Cond. Meter: Horiba U-22	DO Meter: Horiba U-22
Purge Start: 08:05	Purge End: 08:13	Total Volume Purged (gal): 0.00

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor

Sampling Data

Sample Information	Final Purge Readings	Hach Field Data (mg/L)	CHEMetrics Field Data (mg/L)
Sample Date: 9/12/2004	DO (mg/L): 0.11	DO: 0	DO High Range:
Sample Start Time: 08:13	Temp (°C): 26.36	CO2: 165	DO High Range:
Sample End Time: 08:51	SEC (µS/cm): 117	Alkalinity: 30	
Field Filtered: <input checked="" type="checkbox"/>	pH: 6.07	Ferrous Iron: 3	CO2 High Range:
Duplicate: <input checked="" type="checkbox"/>	ORP (mV): -147	H2S: 5	CO2 Low Range:
	Turb (NTU): 584	Manganese: 0	
		Sulfate: Sulfide: Nitrate:	Alkalinity High Range: Alkalinity Low Range:
<u>Lab Analyses/Methods:</u> "Methane, Nitrate/Nitrite, Sulfate, TRPH, VOCs, Hydrogen"	<u>Technician Initials</u>		

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 07-71009/7	Project Name: Groundwater Sampling at Study Area 36NW	
Technician 1:	Technician 2: Larry Wolski	Weather: "Muggy, Sunny"
Sampling ID: 07-71009/7:MW-44C:9/12/04		
Notes:		

Well Information

Well ID: MW-44C	Sampling Date: 9/12/2004	
Well Diam (in): 2.0	Total Well Depth (ft): 35.50	Well Screen Interval (ft): 30-35
TOC Elevation (ft msl): 114.65	Northing: 1537939.02	Easting: 549717.5
Static Depth to Water (ft): 6.31	Well Capacity (gal): 0.00	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 33.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Purge Start: 08:00	Purge End: 08:09	Total Volume Purged (gal): 0.70

Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (μS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
08:03	6.53	0.30	0.10	0.38	26.71	59.0	4.99	-141.8	45.10	turbid	sulfuric
08:06	6.52	0.50	0.06	0.33	26.65	56.0	4.93	-144.7	58.00		
08:09	6.50	0.70	0.06	0.28	26.60	54.0	4.83	-145.3	62.70		

Sampling Data

Sample Information	Final Purge Readings	Hach Field Data (mg/L)	CHEMetrics Field Data (mg/L)
Sample Date: 9/12/2004	DO (mg/L): 0.31	DO: 0	DO High Range:
Sample Start Time: 08:10	Temp (°C): 26.59	CO2: 130	DO High Range:
Sample End Time: 08:25	SEC (μS/cm): 52	Alkalinity: 10	
Field Filtered: <input type="checkbox"/>	pH: 4.8	Ferrous Iron: 1.4	CO2 High Range:
Duplicate: <input type="checkbox"/>	ORP (mV): -147.5	H2S: 5	CO2 Low Range:
	Turb (NTU): 68.3	Manganese: 0	
<u>Lab Analyses/Methods:</u> "Methane, Nitrate/Nitrite, Sulfate, TRPH, VOCs, Hydrogen"	<u>Technician Initials</u>	Sulfate: Sulfide: Nitrate:	Alkalinity High Range: Alkalinity Low Range: